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October 29, 2007

Docket Control  
Arizona Corporation Commission  
1200 West Washington Street  
Phoenix, Arizona 85007

RE: Arizona Public Service Company General Rate Case  
Docket Nos. E-01345A-05-0816, E-01345A-05-0826, E-01345A-05-0827

Dear Sir or Madame:

Pursuant to Decision No. 69663 (June 28, 2007), Arizona Public Service Company is submitting as a compliance item in the above referenced dockets a report of an evaluation regarding the management of aging equipment at the Palo Verde Nuclear Generating Station.

If you have any questions or concerns please contact Jeff Johnson at (602) 250-2661.

Sincerely,

Barbara Klemstine

BK/dst

Attachments

CC: Brian Bozzo

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## COMPLIANCE REPORT REGARDING MANAGEMENT OF AGING EQUIPMENT AT THE PALO VERDE NUCLEAR GENERATING STATION

On November 9, 2005, the Arizona Corporation Commission (the "Commission") opened Docket No. E-01345A-05-0826 to review the frequency and causes of unplanned outages at the Palo Verde Nuclear Generating Station ("PVNGS" or "Palo Verde"). Commission Staff awarded the contract to conduct this review to GDS Associates, Inc. ("GDS"), which issued its final audit report (the "GDS Report") on August 17, 2006.

One of the recommendations in the GDS Report suggests that the Commission should order Arizona Public Service Company ("APS" or "Company") to "evaluate its programs to deal with aging equipment at Palo Verde."<sup>1</sup> Subsequently, in Decision No. 69663, dated June 27, 2007, the Commission ordered APS to file "a report with the Commission'[s] Docket Control.....describing the findings of the evaluation and the actions taken to improve.....management of aging equipment issues at Palo Verde."<sup>2</sup> APS submits this Report in response to that requirement.

The Company has evaluated the programs it currently has in place to monitor and manage its aging equipment. As the Commission is aware, Palo Verde has cooling towers and other equipment that is more than twenty years old. Inherent in APS' overall plant management procedures are various processes intended to improve the quality and operations of its aging plant, as described herein. Although APS believes that it has made and is making significant progress in this effort, it is also examining other ways of enhancing the aging management programs currently in place.

APS agrees that a significant building block of quality performance at Palo Verde is the effective and efficient management of equipment, including evaluation of the life cycle of critical plant equipment, and of technological obsolescence and advancement. In fact, recent initiatives at Palo Verde including steam generator replacement and main turbine rotor replacement on all three units, as well as the heightened review of cooling tower equipment highlight APS' commitment to ensure that the plant is able to maintain the highest level of performance as an integral part of both APS' long-term resource strategy and the Company's commitment to provide reliable, safe and the lowest possible cost energy to APS customers.

### **I. Existing Aging Equipment Management Initiatives**

To maintain current systems and equipment, Palo Verde staff must anticipate potential concerns and proactively develop methods that inspect and maintain existing equipment, as well as provide for the repair or replacement of critical components and systems prior to failure. Presently, Palo Verde conducts a number of programs which manage the continued reliability of plant equipment. These programs implement

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<sup>1</sup> See GDS Report, p. 4.

<sup>2</sup> See Decision No. 69663, p. 158, line 15.

activities which address the management of aging equipment and obsolescence in general. The scope of responsibility for the Company's Plant Health Committee ("PHC") includes review and replacement of aging plant equipment.

The PHC is a management committee responsible for providing oversight of overall plant health processes and ensuring that required resources are allocated for activities required to maintain reliable plant performance. The PHC is also responsible for ensuring that important plant issues are identified, prioritized and acceptably resolved in a timely manner. The PHC's activities are conducted in accordance with industry accepted best practices.

The focus of the PHC is sustained long term and continuously improving performance of plant equipment and the resolution of issues affecting plant health. The PHC's activities include review and approval of system recovery plans and periodic monitoring of the progress of those plans intended to ensure that systems are returned to more acceptable performance levels. In addition, the committee periodically reviews engineering programs to ensure continued improvement in equipment reliability.

The PHC prioritizes and schedules the design changes required to resolve aging and obsolescence issues, challenges to nuclear and industrial safety, and improvements to system and component performance.

The following are examples of recent PHC decisions that have addressed aging equipment:

- The scheduled replacement of now-obsolete Foxboro control room chart recorders. These components are located in each of the unit control rooms and are relied on by operations staff for the assessment of post-accident plant conditions.
- Replacement of the Auxiliary Feedwater ("AF") system turbine governors. This design change replaces a now-obsolete mechanical governor with a more reliable digital governor and simplifies the valve arrangement for operating the steam driven AF pump.
- The re-tubing of the Essential Cooling Water ("EW") system heat exchangers. The PHC has approved the replacement of the existing tubes in the EW heat exchangers in order to restore design margin, reduce the likelihood of inter-system leakage, and increase the long term equipment life for this critical plant component.

The PHC has been effective at providing management oversight and aligning resources to make needed plant improvements. This interdepartmental panel has been able to review proposed modifications and provide a comprehensive assessment of priorities, assess the ability of the proposed modification to address the equipment and system challenges and recommend a schedule for implementation. Addressing the aging

of plant equipment and systems is a critical challenge that the PHC is tackling and will continue to monitor as it reviews equipment and station performance.

Another program that is in progress at PVNGS is an initiative to review the plant's Information and Control ("I&C") Technology requirements. The ability to ensure the long term reliability and availability of plant I&C equipment is an important station priority. PVNGS I&C systems are increasingly facing hardware and software obsolescence issues and growing lifecycle costs due to the aging technology employed in these systems. Safe, productive, and cost-effective operations require superior application and integration of automation and information technology, and its effective management will be a key success criterion for the station. Historically, attainment of this goal has been complicated by:

- Excessive complexity resulting from a large number of dissimilar components.
- Lack of replacement parts and repair service.
- Lack of standardized computer hardware, software coding systems, and robust software development procedures.
- Operational work-arounds due to limited hardware functionality.

Older I&C systems are incapable of expandability and automation, relatively ineffective in providing maintenance personnel with automated support, and more difficult to maintain due to the large maintenance support staff required to achieve the system availability requirements for the site (e.g. parts, materials, training, ancillary support, etc.). Since a significant amount of the I&C hardware is increasingly obsolete and unavailable from original suppliers, rework and repair is becoming difficult due to part unavailability and the eroding analog knowledge base in the industry as a whole. Also, application software, compilers, and operating system software suffer from inefficient legacy programming methods and hardware imposed design constraints.

These issues have forced the industry to replace the analog and older digital technology with newer, improved and more cost-effective technologies. The need for an equipment reliability strategy that embodies the concepts of safe, cost-effective operation and a "zero tolerance" for on-line equipment failure requires a new approach to I&C equipment operation, maintenance, and ultimately replacement. To address these issues, a comprehensive overall site I&C management strategy, rather than stand-alone I&C ad hoc system replacement strategies, has been implemented in order to enhance long term efficient station operation. This strategy will promote safe and economical management of technology assets. A focus on proactively managing I&C technology assets to ensure alignment with Palo Verde business and technical goals is the goal of the program.

The I&C asset management program is providing for long-term management of plant I&C assets. Asset management is a forward-looking planning tool that maximizes I&C equipment reliability, maintainability and availability for the life of the plant in a

cost-effective manner. The process uses both technical and economic inputs to derive the best options and schedule for system maintenance or replacement. Asset management is a "living strategy" that is continually monitored and revised based upon constantly changing technical developments and fiscal constraints.

The essence of the asset management strategy is to balance the useful life of current I&C systems with a comprehensive modernization program. This plan supports performance-based objectives for the life of the plant. It includes maintaining system reliability until replacement is necessary, addressing obsolescence issues proactively, optimizing replacement schedules for both systems and components, and providing training and maintenance support.

This comprehensive strategy, considering the systematic integration and coordination of each replacement project into an asset management plan, ensures a cost-effective control, computing and data-processing environment. For long term viability, this plan specifically addresses the issues of life cycle governance of I&C based technology assets and the integration of systems into a distributed network where appropriate. Under this program, a steering committee has been formed that is responsible for:

- Approving bidders for digital upgrade projects.
- Approving exceptions to preferred suppliers.
- Approving selected hardware and software vendors.
- Avoiding solutions that would be unique to PVNGS.
- Determining system upgrade priorities.
- Assisting with bid evaluations as necessary.
- Ensuring that software standards for communications, verification and validation, and cyber security are met.

Palo Verde's effort to address the aging and obsolescence of digital equipment is expected to develop a comprehensive strategy to schedule, fund and prioritize recommended plant changes for implementation.

## **II. Planned Aging Equipment Management Initiatives**

Although the Company believes that the programs described above are individually effective for their specific purposes, APS is continuing to evaluate its aging equipment management program in order to improve the operations of Palo Verde. In early 2007, the new Palo Verde senior leadership team, as part of an overall site plan, began a broader and more long-term focused review of strategic programs designed to achieve

sustained superior performance at Palo Verde. One specific focus area is intended to enhance equipment reliability throughout the plant. Given the aging of Palo Verde systems, a specific initiative that has been identified in the review of strategic programs is to expand, consolidate and advance the aging equipment and obsolescence programs throughout the plant. Over the next two years, this initiative will:

- Benchmark best practice equipment aging and obsolescence programs in the nuclear industry.
- Determine program roles and responsibilities.
- Develop, or revise existing program documents, to support such a program.
- Identify and train stakeholders on the equipment aging and obsolescence program in accordance with the site's systematic approach to training.

APS expects that this initiative will enhance Palo Verde's aging equipment management programs by providing a comprehensive and focused effort on this issue and consolidating the current efforts underway into one program.